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Lab honors four with Fellows Award

by Tim Anderl, AFRL Headquarters

WRIGHT-PATTERSON AFB, OHIO — The Air Force Research Laboratory recently honored four of its finest scientists and engineers during the 2000 Fellows Day celebration at the U.S. Air Force Museum. The Fellows Award confers a lifetime status, and recognizes outstanding contributions in research and development and/or exceptional technical program management.

During the ceremony, Air Force Materiel Command commander General Lester Lyles said, "I am confident that whatever

new horizons there are, whatever things are still yet to be discovered, a lot of those things and discoveries will be done by the people of the Air Force Research Laboratory, the likes of whom we're going to be honoring tonight."

Four scientists were honored during the event, Dr. Edward Altshuler, Dr. Susan Gussenhoven-Shea, Dr. Daniel B. Miracle and Dr. Daniel W. Repperger, have conducted their outstanding work at directorates housed at Wright-Patterson

(SEE FELLOWS/P.4)



THEY'RE THE JOLLY GOOD FELLOWS — AFMC Commander General Lester Lyles, far left, and AFRL Commander General Paul Nielsen, far right, congratulate Dr. Edward Altshuler, Dr. Daniel Miracle, Dr. Susan Gussenhoven-Shea, and Dr. Daniel Repperger during the Fellows induction ceremony on November 7.

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The official voice of the Air Force Research Laboratory

news@afrl

Fall 2000

Volume II, Issue 3

Commander

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news@afrl is published quarterly by the Office of Public Affairs of Air Force Research Laboratory Headquarters. Contact the office at AFRL/PA 1864 Fourth St. Suite. 1, Wright-Patterson AFB, Ohio, 45433-7131, (937) 656-9010/9876, or send e-mail to AFRL.PA@afrl.af.mil. Contents of this newsletter are not necessarily the official views of, or are endorsed by, the U.S. Government, the Department of Defense or the Department of the Air Force. The editorial content is edited, prepared and provided by this office. Photographs are official U.S. Air Force photos unless otherwise indicated. Submission guidelines are available from this office or on-line. Electronic copies and additional full-text articles are available on-line at:

<http://extra.afrl.af.mil/news/index.htm>

Hawaii hosts change-of-command ceremony

by Rich Garcia, Directed Energy Directorate

MAUI, HAWAII — Maj. J. Raley Marek and Maj. F. Joseph Bishop exchanged command of Air Force Research Laboratory facilities on September 1.

Marek assumed command of the laboratory's Detachment 15 as well as becoming chief of the Space Surveillance Systems Branch of the laboratory's Directed Energy Directorate. Bishop moved to a new assignment at the Space and Missile Systems Center at Los Angeles (Calif.) AFB.

Among his responsibilities, Marek oversees the operation of the Defense Department's largest telescope and a \$115 million supercomputer system known as the Maui High Performance Computing Center. He also supervises the work of 14 military and government civilian employees and oversee seven contracts valued at \$86 million with more than 200 contractor people.

With a bachelor's degree from Texas A&M in College Station, Texas, and a master's degree from the Institute of Technology at Wright-Patterson AFB, Ohio, both in electrical engineering, Marek has been in the U.S. Air Force since 1986. His career includes assignments in engineering, logistics, intelligence, nuclear weapons, and research and development. He served at Kelly AFB, Texas, and Kirtland AFB, N.M., and in the Washington, D.C., area.

Among his military awards, Marek has a Defense Meritorious Service Medal, a Meritorious Service Medal, an Air Force Commendation Medal and an Air Force Achievement Medal.

Bishop's career has included tours in engineering, space operations, acquisition, and research and development. He served at Vandenberg AFB and Onizuka AFB, both in California, and in the Washington, D.C. area. @

Find additional features on the web.....

Cadets combine technology, training at Rome

World's largest titanium component delivered for laser

Five Flags Speedway partners with AF Lab

Laboratory invents 'all gas' chemical laser

General Nielsen speaks to N.M. industry gathering

Airborne Laser Office practices towing big aircraft

by Ken Englade, Airborne Laser Program Office

KIRTLAND AFB, N.M. — It isn't as difficult as trying to force a square peg into a round hole, but it's close.

There are easier tasks than trying to get an airplane with a 213-foot wingspan through a door that is only 203 feet wide. That's why a dozen and a half people from the Airborne Laser System Program Office, Detachment 2 of the Flight Test Center, Boeing, Edwards AFB, Sandia National Laboratories, the Boeing Commercial Airline Group and the Federal Aviation Administration were sweltering on the tarmac on August 3 practicing a maneuver they will have to put into practice when the world's first completely laser-armed combat aircraft reports for flight tests at Edwards in about two years.

While at Edwards, the 747-400F will be housed in a hangar at the Birk Test Flight Facility in between flying missions, a condition made necessary because of the high summertime temperatures at Edwards and the heat-sensitivity of some the Airborne Laser's unique equipment. During the summer, it is not unusual for tarmac readings at Edwards to approach 120 degrees Fahrenheit.

When the hangar was built at Birk there were no planes as large as the 747-400 so the doors are not

(SEE LASER/P.5)



WHEN ROTATING THE TIRES IS A 'BIG DEAL'— Master Sgt. Mark Hall of the Airborne Laser System Program Office demonstrates how a lockpin has to be removed from a 747 gear assembly to allow the wheels to rotate so the plane can be towed into a hangar whose doors are not wide enough to accommodate the aircraft's wingspan.

Space Vehicles moves close to 'problem-solving' aircraft

by John Brownlee, Space Vehicles Directorate

KIRTLAND AFB, N.M. — Launched recently aboard the Space Shuttle Atlantis is the first scientific payload bound for the new International Space Station (ISS). If Air Force hopes are realized, the experiment may mark the road to a whole new generation of "smart" spacecraft able to make decisions and solve problems — all without human intervention.

Managed by the Air Force Research Laboratory and slated to begin in October on the ISS, this experiment, dubbed MACE II (Middeck Active Control Experiment Reflight) is a significant move toward spacecraft autonomy. It consists of a hardware/software package that will independently learn to control motion-dampening technologies and suppress unwanted vibrations.

"If MACE II software can control our deliberately induced vibrations (which are typical to spacecraft subsystems), it will be an important contribution in the eventual design of self-reliant spacecraft able to 'think through' and solve many of their own problems," said Rory Ninneman of AFRL's Space Vehicles Directorate. "Building spacecraft that are more autonomous and reducing the human factor now required for spacecraft management will inherently result in lower costs and permit more flexible and reliable missions."

Performed by the ISS crew, the experiment will be the first demonstration of "autonomous adaptive structure control" in space Ninneman said. The essence of MACE II is that it creates the necessary control instructions "on the fly" to counteract unwanted disturbances without any input from a human being. These vibration control algorithms use embedded sensors and

actuators to identify and counteract movement, all without requiring extensive modeling or ground testing. The algorithms can also adapt to changes in a structure caused by temperature fluctuations, moving parts, or the normal degradation of mechanical subsystems. Such autonomy is precisely the requirement aerospace engineers have in mind for spacecraft of the future.

"For example, today, if we want to send a spacecraft to orbit the moon, we give it very specific instructions: 'Go to a given point in your trajectory, turn left so many degrees for so many kilometers,'" Ninneman said. "But in the future, spacecraft will have more complexly detailed objectives, such as traveling to the far side of the moon for photographs. Our efforts now will eventually enable these higher-level missions, and as a result, the spacecraft itself will determine how to accomplish them."

An example of how MACE II-like technology might have help avert a spectacular disaster is where an engine explosion can cause an aircraft to lose hydraulic control of its flaps, rudders, and ailerons.

Perhaps if adaptive control technology is available to that pilot, he might push a 'panic button' that engages a problem-solving autopilot, said Ninneman. The technology might lower only the landing gear on one side of the aircraft for drag, and increase engine thrust on the other, giving the aircraft at least some ability to maneuver out of harm's way.

Managed by AFRL's Space Vehicles Directorate, MACE II is
(SEE MACE II/P.5)

Fellows (from page 1)

AFB and Hanscom AFB.

Altshuler studied in Massachusetts where he received a bachelor's degree at Northeastern University, master's at Tufts University and doctorate from Harvard. In 1960, he joined the now the Air Force Research Laboratory Sensors Directorate.

Altshuler has become internationally recognized for his contributions to the science and technology of ordered intermetallic alloys and metallic composite materials.

Altshuler is an expert in the field of electromagnetics who has made significant contributions to the Air Force, DoD, NATO and the scientific community. In the early sixties he investigated the feasibility of using the millimeter-wave region of the spectrum for military applications. He recognized that high-gain, high-resolution antennas of moderate size, and compact, lightweight system components that can be obtained at these wavelengths, were applicable to space vehicle instrumentation.

More recently, he received a patent for a process for the design of antennas using Genetic Algorithms. Altshuler has participated in over 100 scientific publications, patents and presentations.

Gussenhoven-Shea earned her bachelor's degree from Mount Holyoke College, and master's from Minnesota. After teaching high school physics in Kingston Jamaica, she entered the newly formed doctorate program in Space Physics at Boston College.

Gussenhoven-Shea worked as an Air Force contractor at the

Geophysics Laboratory at Hanscom AFB, and in 1983 she joined the laboratory — now the Air Force Research Laboratory Space Vehicles Directorate — to head up the Combined Release and Radiation Effects Satellite Science Team.

Recognized as a leading expert in three areas of space research: auroral physics, spacecraft charging, and space radiation effects, she has been sought by NASA to serve as an expert on their teams.

During her time with the lab, she has garnered leadership roles in the Spacecraft Charging at High Altitudes, and Combined Release/Radiation Effects Satellite programs. These satellites carried the most advanced set of experiments ever flown to study spacecraft arcing and microelectronic upsets.

Miracle received his bachelor's degree at Wright State University before joining the now the Air Force Research Laboratory Materials and Manufacturing Directorate. He obtained his doctorate from Ohio State University through a Long-Term Full-Time Training grant sponsored by the Air Force.

Miracle has become internationally recognized for his contributions to the science and technology of ordered intermetallic alloys and metallic composite materials.

His research has led to significant advancements in intermetallic alloys and metal matrix composites (MMC's). His early studies on intermetallic alloys contributed to the successful engine demonstration of an advanced NiAl single crystal vane alloy, which has shown a dramatic improvement in the thrust-to-weight ratio of advanced gas turbine engines.

(SEE FELLOWS/P.5)

Munitions with extended range wings glides to target

by Rex Swenson, Munitions Directorate

EGLIN AFB, FLA. — Officials at the Air Force Research Laboratory Munitions Directorate in conjunction with Alenia Marconi Systems and Boeing conducted a crossrange flight test of a modified Joint Direct Attack Munition (JDAM) recently at White Sands Missile Range in New Mexico.

Known as the JDAM-ER (for Extended Range), the weapon incorporates the use of a strap on wing device called Diamond Back. According to Air Force Lt. John Mehrman, JDAM-ER program manager, the Diamond Back is a low cost, high performance wing kit, which features a joined tandem wing design. The wings extend from a compact storage position and once they are fully deployed, they form a diamond-shaped platform.

In describing the test, Mehrman said the weapon was launched from an F-16 at 21,000 feet at .78 Mach and within 4 seconds the wings deployed and it began gliding down range on its own. After flying 11 nautical miles down range and 4 nautical miles crossrange, the JDAM-ER hit within lethal distance of its target at a specified GPS coordinate.

"Diamond Back increases the range of the JDAM from 8 to approximately 24 miles when launched at 20,000 feet," Mehrman said. "This not only extends the range of the weapon, but also helps protect our warfighters by providing additional survivability for the delivery aircraft. It also



THE MUNITIONS BENEATH MY WINGS — Pictured is the JDAM-ER (for Extended Range). The weapon incorporates the use of a strap on wing device called Diamond Back. Officials at the Air Force Research Laboratory Munitions Directorate in conjunction with Alenia Marconi Systems and Boeing conducted a crossrange flight test of a modified Joint Direct Attack Munition (JDAM) recently at White Sands Missile Range in New Mexico.

allows the attack of multiple, widely separated targets from a single release point," he said. @

Laser (from page 3)

wide enough to allow the plane to be pulled straight into the shelter. So the specially-trained maintenance crew will have to "crab" it in tail first, on an angle. The procedure is roughly equivalent to backing an SUV-sized trailer into a garage whose door was built to accommodate a Volkswagen.

As the first step toward developing a

procedure to accomplish the task, maintenance crews and engineers outlined the dimensions of the Birk hangar on an unused section of the flight line with duct tape and orange construction barrels. Then, using powerful aircraft tow tugs, they angled the tail of a 747-100 being used as a demonstrator through the simulated "doors."

With the 747 tail almost halfway in, the maintenance crews removed a 2 1/4-inch lock pin from the body gear assembly and

swiveled the wheels into a 36-degree angle, leaving the under-wing gear wheels in their normal position. Once the "slant" was set, the tugs pulled the aircraft inside. The procedure was reversed to bring the aircraft out.

The towing practice was only one of numerous tests and practices scheduled for the ABL before the aircraft, which currently is being modified at the Boeing facility in Wichita, Kan., begins shooting down missiles in 2003. @

Fellows (from page 4)

His recent research on MMCs contributed to the first Air Force specification of a fiber-reinforced metal matrix composite, and the first aerostructural component of particle-reinforced MMC. The latter application resulted in a \$26 million savings to the Air Force.

Dr. Daniel W. Repperger arrived in Dayton in 1973 following his graduation from Purdue University, Indiana. He joined the Aeromedical Research Laboratory, now the Human Effectiveness Directorate, in 1975 after his work as a postdoctoral fellow with the National Research Council at Wright-Patterson AFB.

Repperger has become internationally recognized for contributions to the investigation of mechanical energy and how it impacts human-machine interfaces.

Repperger has established himself as a leader in the scientific community by modeling human control performance in complex flight motion environments. His patent was the original in the

field of "haptic control devices." These devices have become widespread in the computer game and flight simulation industry.

The technology has also been applied to the field of rehabilitation medicine and is literally touching and improving the lives of motorically injured and impaired people.

In 1996, Repperger had his pain mitigation research study with the Veterans Administration selected as one of the top one hundred innovations in the United States. It was published in the annual book, Innovations 96, which was endorsed by the American College of Physician Executives. He has also won numerous awards from the Institute of Electrical and Electronic Engineers (IEEE), including the Third Millennium Medal for his technical leadership.

In recognizing these individuals, Air Force Research Laboratory Commander, Brigadier General Paul Nielsen said, "They are scientists of world renown, men and women whose exceptional performance and national recognition are considerable. Each of the candidates has had to already demonstrate continuous significant lifelong personal contributions. This is a tough honor to get. They continue a proud tradition." @

MACE II (from page 3)

supported by two science teams. AFRL's team includes Planning Systems, Inc., Melbourne Controls Group, of Melbourne, Fla.; Payload Systems, Inc., of Cambridge, Mass.; the University of Michigan; Virginia Tech; and Sheet Dynamics, Ltd., of Cincinnati, Ohio.

The other team, managed by the Massachusetts Institute of Technology (MIT), includes Lockheed Martin; Midé Technology Corporation of Cambridge, Mass.; and NASA's Langley Research Center. The Air Force Space and Missile Systems Center Space Test Program provides launch liaison with NASA for MACE II.

The MIT-designed MACE hardware first flew in March 1995 aboard the Space Shuttle Endeavour. In that experiment, researchers studied classical vibration control approaches and their applicability



TECHNOLOGY CORRECTS 'ON THE FLY' — Pictured is the original MACE experiment aboard the Endeavor in 1995. The MACE II experiment consists of a hardware and software package that will independently learn to control motion-dampening technologies and suppress unwanted vibrations.

to a variety of space-based structures.

MACE II is a cost-effective science program calculated to benefit future Air Force spacecraft as well as the many relevant spin-offs likely for use by industry. @

C^aolumns

Commander's Corner

November 2000



Brig. Gen. Nielsen

As we near the end of this calendar year, the blur of activities are both exciting and monumental for AFRL. These past few weeks, AFRL has celebrated significant events including the 50th Anniversary of the Air Force Chief Scientist's Office, the AIAA dedication of the Edwards Research Site, and the S&T summit. I had the great fortune to attend the 50th Anniversary of the Air Force Chief Scientist's office on October 30th, where they presented a brief

historic review of the motivations and synergy of the men who first began this office and the commanders who had the vision and fortitude to push this through to fruition.

It was extraordinary to stand before the crowded room of scientists, engineers and commanders, who have the desire to bring the best of science and technology to the warfighter. To hear the commitment expressed by Air Force leadership, such as General Mike Ryan and General Les Lyles was equally encouraging. They reinforced our belief that S & T is ever important to the future of the Air Force as any other part of our aerospace force. I was proud to represent you at this remarkable time in our history.

Another event saluting the AFRL men and women of S&T occurred last week at our Propulsion Directorate's Edwards Site, "The Rock". As part of AIAA's Evolution of Flight's 100th Anniversary program, they have selected noteworthy historic aerospace sites for their accomplishments and place in history – PR's Rocket Site is one. The Rocket Site's superb record of past accomplishments is amply written in the history books of Air Force science and technology. It was an honor to represent AFRL in this celebrated occasion. It is important that we never forget our proud legacy and the lasting contributions of all the great men and women who have preceded us.

Also within this short span of time, we had the second series of S&T Summits with the Air Force Chief of Staff and the Secretary of the Air Force. I'd like to thank everyone in AFRL for making this summit a success. Your good work enabled AFRL to provide a quality review of the Advanced Technology Demonstration (ATD) portfolio to the CSAF, SECAF, and MAJCOM Commanders. Air Force senior leadership expressed strong support for AFRL programs and asks that we continue to work with the acquisition community to reduce the time and resources required to transition ATDs to the field.

During the Summit, senior leadership endorsed several AFRL and AFMC sponsored initiatives aimed at enhancing the value of AF S&T to the warfighter. AFMC's effort to reenergize development planning was identified as key to the AF modernization process. AFRL plans to align S&T investments to the AF Core Competencies and Critical Future Capabilities received high-level support. The CSAF also commended the Applied Technology Councils (ATCs) for significantly increasing the number of ATDs with identified sources of transition funding.

Three years ago, this laboratory was formed out of the sweat, blood, determination and dedication of the four super labs and all within it. I wanted to thank you for your continued efforts at making this laboratory the best in the nation as we go into our fourth year as one. Our success, accomplishments, and future depend on you and your faith, enthusiasm, imagination and contagious energy. I know that together, we will continue to create the dreams of the future, turning science fiction into science fact. It's absolutely incredible what can be accomplished when great minds work together to do so.

As we enter into the Thanksgiving week, I want to thank you for giving your time, energy, and incredible talents toward S&T in creating those dreams of the future. We are carrying on the tradition of those who first came to this nation, exploring the worlds of science and uncharted technology just as the early settlers did with the new world.

From my family to yours...we wish you a very Happy Thanksgiving! @

Check out the previous Commander's Corners at the AFRL Homepage:

June 2000 (available online at <http://www.afrl.af.mil/commcorn/jun00.htm>): "It's been two months since the change of command here at AFRL and I'm slowly but surely winding my way through the directorates to see each of the sites and meet the great people that make up our laboratory..."

October 2000 (available online at <http://www.afrl.af.mil/commcorn/oct00.htm>): "We're jumping into Fiscal Year 2001 with excitement and optimism. AFRL continues to deliver tremendous innovations to our Air Force and our senior leaders continue to recognize our impact on the Air Force's future..."

Columns

CIO Tips

OPSEC: Protecting technology, our business 'marrow'

by Mark Rogers, Operations Security

Operations Security (OPSEC) is an integral part on AFRL functions. It goes hand in hand with other security disciplines to support the protection of technology — the marrow of our business.

OPSEC is an on-going system of periodic checks and balances to ensure critical information is protected for our laboratory operations and warfighting customers. It applies to all AFRL products that are generated as a result of a warfighter technology need or shortfall. This also includes briefings, conferences, symposiums, lectures and other activities related to AFRL.

Historically, OPSEC focus has been placed within the operations arena and OPSEC plays an important role in an operational wing. However, Wright-Patterson Air Force Base also has many organizations that provide oversight and day-to-day program management in research, development, manufacturing, deployment and ongoing logistics support of weapons systems. Within AFRL, the primary mission of many activities is acquisition-related. This environment is not routinely thought of as needing an OPSEC program, but these are not routine activities!

Adversaries are highly interested in trying to dull the USAF's sharp technological edge by methods that may directly target Wright-Patterson organizations and their defense contractors. Let's explore some methods that may require a closer OPSEC look.

One Person's Trash is Another Person's Treasure

Who was it that said computers are creating a paperless society? This could not be further from the truth. The convenience of printing countless drafts, sending documents as attachments, and the "forward" icon as an e-mail feature has created a mountain of paper products. Laser printers are abundant, and documents can be created with ease. These all contribute to tons of paper. Let's face it...it is much easier to create paper products now than it was 15 years ago.

Much of what is being created can be unclassified sensitive information or For Official Use Only (FOUO) information that could possibly lead an adversary to development of your activity-specific Critical Information. Current regulations allow FOUO information to be "torn into pieces" (as opposed to shredded). Ask yourself if the risk of this perfectly legal procedure for the destruction of FOUO is really appropriate for your organization. It is a balance between vulnerability and risk. A number of organizations elect to destroy or shred all paper products.

The Internet as a Major OPSEC Concern

Web pages have become a means of transmitting information

quickly to the customer. Web pages require appropriate review prior to posting. If your organization has a web page, is the OPSEC Program Manager for your activity, involved in the review process? If they aren't now, they should be.

Non-public access web pages that contain sensitive unclassified or FOUO information must be properly protected through the use of firewalls, passwords and/or encryption. AFI 33-119, Electronic Mail (E-Mail) Management and Use, states the following:

"Users of E-mail systems must stay constantly aware of communications systems vulnerabilities and the need to safeguard "critical information," OPSEC indicators, and sources of such information. As a minimum, you must encrypt "critical information," OPSEC indicators, and sources of such information before transmission across the Internet."

As information technology become faster and interconnectivity becomes larger, the system is only as good as its weakest link. The potential information sinkhole that can be created due to poor OPSEC could literally put systems and lives on the line. Computers are definitely a growth industry for OPSEC.

Restricted Controlled or Open Access?

As trivial as it may sound, office techniques in place within active program's can make a difference in mitigating potential vulnerabilities. Public access through some areas (public...meaning personnel outside your organization) could become an OPSEC issue. Minimizing or negating through-traffic within the office also may be in order. Within an open office environment, personnel should be in the habit of routinely challenging folks that aren't part of the organization and appear to be walking through.

Clean Desk or Adversary Gold Mine?

A clean desk policy helps to ensure potential OPSEC indicators don't become targets of opportunity. Test schedules, TDY itineraries, ongoing technical/contractual documents all may have potential value and are the type of information normally accessible on the desktop.

OPSEC Synergy

In OPSEC, the sum of the parts always is worth more than the whole. Collecting seemingly benign OPSEC indicators could potentially expose major weapons system vulnerabilities. This synergy works both ways. Having a viable organization OPSEC program includes paying attention to otherwise minor details, as minor details can add up exponentially. Enforcing a number of OPSEC initiatives has a combined effort that will pay dividends by mitigating vulnerabilities.

With proper support from AFRL members, critical information and technology will be protected and our technological advantage will be uncompromised. @

TD Spotlight --

Munitions Directorate: A strong technology base for disarming battlefield threats

by Munitions Directorate

EGLIN AFB, FLA. — The Air Force Research Laboratory's Munitions Directorate, located at Eglin AFB Northwest Florida's Emerald Coast, develops conventional munition technologies to provide the Air Force with a strong technology base upon which future precision air-delivered conventional munitions are developed to neutralize potential threats to the United States.

The Munitions Directorate continues to make technological breakthroughs for future air armament. The directorate's emphasis is on the weapon's capability to operate with complete autonomy and with high accuracy when delivered against ground targets in all weather conditions, day or night, using long- or short-range delivery tactics.

Toward these goals, the Munitions Directorate is divided into three technol-

ogy product and three support divisions.

The Assessment and Demonstrations Division researches new computer analysis capabilities, develops models, and subsequently utilizes them to perform effectiveness analyses on advanced weapons concepts to determine optimum technology options for further development. It also conducts weapon demonstration projects, which integrate guidance and ordnance technologies with new weapon airframe and aircraft carriage techniques, to prove that the technology is mature and ready for transition.

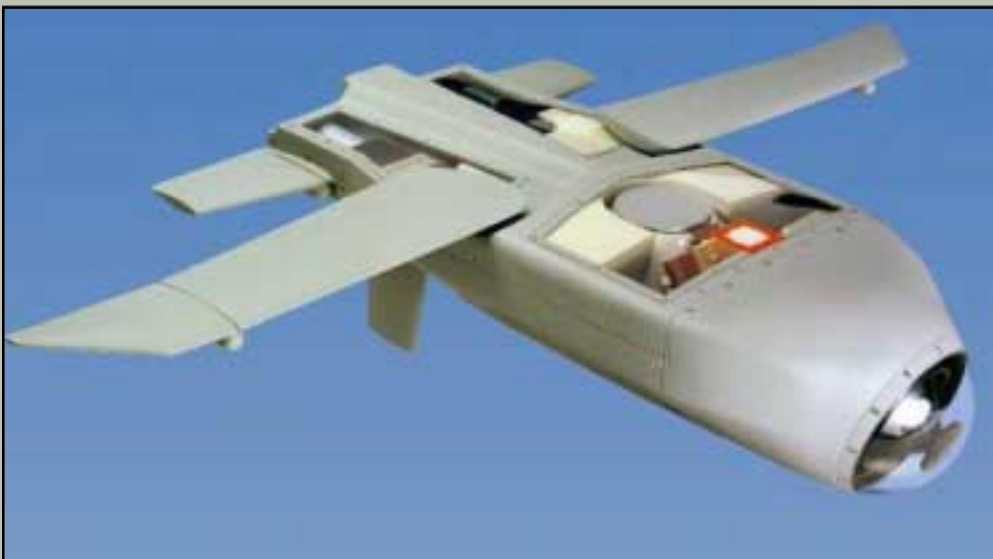
The Advanced Guidance Division directs and conducts basic, exploratory, and advanced development research in seekers, algorithms, processors and control loops for affordable air-to-air and air-to-surface conventional munitions and submunitions, as well as exoatmospheric interceptors. Much of the technology

focus is on autonomous precision-guided air-to-air and air-to-ground munitions, with decreased susceptibility to counter measures, improved weather performance, enhanced utility, and decreased cost.

The Ordnance Division researches, develops, and transitions ordnance technologies for development into air-delivered ordnance systems. These efforts span the entire life cycle of the technology from conceptual design through proof-of-principle evaluation, breadboard and brass-board testing, subsystem development, and component demilitarization. The technology emphasis of this division is the development of ordnance for defeating mobile and armored targets, deeply buried underground targets, and aerial targets.

The Operations and Integration Division enables the Directorate's mission by providing well-conceived and executed business computing, human resource management and business development services. The Financial Management Division enables the Directorate to manage its financial resources and the Procurement Division provides an in-house contracting capability.

Since the directorate's inception, the research and development efforts have focused on user needs. The significance of applying leading edge technology to provide the user with the state-of-the-art weaponry makes a dramatic impact on the outcome of any given strike mission. Technology endeavors over recent years have manifested themselves in a variety of non-nuclear air armament, some of which were employed in operations in Libya and Desert Storm. @



BEGINNING THE WORK — LOCAAS units, one product of the Munitions Directorate's many programs, can search for, identify, classify, and track targets like tanks, armored personnel carriers, trucks, and missile launchers for up to 30 minutes and cover roughly 100 nautical miles. It compares the three-dimensional images stored in its computer memory to the objects that the seeker scans. Through this template matching comparison process, the computer can determine if the object is a target or not. It's called Automatic Target Acquisition (ATA).

Net Index

Due to the number of submissions we receive, some sections of *news@afrl* are available exclusively on-line. The on-line version of the newsletter allows users to view the AFRL corporate calendar, news releases generated by AFRL headquarters, operating instructions, L@b L@urels and Roundups sections.

The L@b L@urels section of the electronic newsletter is dedicated to members of Air Force Research Laboratory who receive awards and honors. The Roundups section of the electronic newsletter keeps Air Force Research laboratory employees informed about contracts AFRL has awarded. Below is an index of articles one can find in each of these on-line sections.

L@b L@urels

- UC Berkley appoints lab



Urtz

engineer as visiting scholar

- AFRL scientist receives *NASA Tech Briefs Award*

- Laboratory professional wins small business award

- Laboratory nominee receives small business award

- Propulsion Directorate scientist named AIAA fellow

- Society presents top award

to research scientist health

- Propulsion scientists wins technology transfer award

- Medal of Honor recipient remembered during ceremony at Rome site

- AFOSR supported research of Nobel Prize winners

- Lab scientist among winners of Research and development award

Roundups

- CACI gets \$48 million to support lab, Air Force goals

- Target, damage assessment software receive upgrade

- Lab contracts for internet language, design monitor

- AF laboratory develops next generation teleconference

- \$21 million in contracts continue laser research

- Universities receive \$6.1

million for research from lab

- Research to increase capacity of fiber transmissions

- Lab targets low cost, improved fiber optic networks

- Technology will enhance, improve internet security

- Demolition contract awarded for Rome consolidation

- Research will make web-based services easier to use

To view the full text of these and other articles visit the *news@afrl* page on the Internet at <http://extra.afrl.af.mil/news/index.htm>.

To submit L@b L@urels or Roundups from your directorate, send a query to AFRL Public Affairs at:

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or,
Anne.Gunter@afrl.af.mil